

POQUONOCK RIVER GROTON CONNECTICUT

SURVEY REPORT



**DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.**

MAY 1972

SYLLABUS

The Division Engineer finds that Federal navigation improvement for Poquonock River and vicinity is not warranted at this time. He finds that improvement of Pine Island Bay by provision of 23 acres of additional anchorage area and access channels all to a depth of 6 feet below mean low water is economically justified. Provision of a channel 6 feet deep leading from Pine Island Bay to the head of Baker Cove with development of a 160-boat capacity marina at the head of the cove is also economically justified. Federal navigation improvement of Poquonock River, by providing a channel from deep water in Pine Island Bay upstream to the naturally deep anchorage area in the river, is dependent upon local construction of a 200-boat capacity marina adjacent to the existing mooring area. At present there is no assurance that such a marina would be provided.

Local officials realize that improvement of these areas is definitely needed but have indicated that more time is needed to acquire the necessary backing to meet the requirements of local cooperation for a Federal project. Therefore, the Division Engineer recommends no Federal navigation improvement for the vicinity of Poquonock River, Groton, Connecticut at this time.

Poquonock River, Connecticut

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ATTACHMENT Information Called for by Senate Resolution 148



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:
NEDED-R

26 May 1972

SUBJECT: Survey of Poquonock River, Groton, Connecticut

HQDA (DAEN-CWP-D)
WASH DC 20314

AUTHORITY

1. This report is submitted in compliance with an item included in Section 112 of the River and Harbor Act approved 3 July 1958, which reads as follows:

"The Secretary of the Army is hereby authorized and directed to cause surveys to be made at ... Poquonock River at Groton, Connecticut ... subject to all applicable provisions of Section 110 of the River and Harbor Act of 1950."

2. The report was assigned to the New England Division by letter of the Chief of Engineers dated 21 July 1958.

PURPOSE AND EXTENT OF STUDY

3. The study was made to determine the need and economic justification for Federal navigation improvements in the Poquonock River and in the two small bodies of water contiguous to its mouth, Baker Cove and Pine Island Bay. The study included a public hearing to learn the nature and extent of local desires, a detailed hydrographic survey to determine desired channel, anchorage, and breakwater sites, and engineering and economic studies. All available maps, charts, and photographs were utilized.

DESCRIPTION

4. The Poquonock River is a tidal estuary in the southeastern part of Connecticut. It is located at the north side of Fishers Island Sound one mile east of the entrance to New London Harbor. The estuary, which has a total drainage area of 29 square miles, consists of three contiguous tidal bodies - Pine Island Bay, Baker Cove, and the Poquonock River. These areas are shown on the inclosed maps.
5. The main boat anchorage is located in Pine Island Bay and is bounded by Avery Point, Jupiter Point, Bushy Point and Pine Island. The anchorage provides protection from all winds except those from the southwest. Pine Island Bay is 70 acres in area and is used exclusively by recreational craft. Depths in the central protion range from 5 to 9 feet at mean low water decreasing to 2 feet off Pine Island and in the berth areas to the northwest side of the anchorage and along Jupiter Point.
6. Baker Cove is a sheltered tidal arm about 90 acres in area. Two small streams enter the upper end of the cove and with tidal action maintain a narrow channel along the western shore. Depths of 3 to 6 feet exist in the natural channel and decrease to 2 feet at the numerous private wharves along the western shore.
7. The tidal portion of the Poquonock River extends over an area of 250 acres. The small recreational fleet based near the upper end is well protected from all storms. The river inlet is generally between 600 to 1,500 feet wide, except opposite the western end of Bushy Point Beach where the inlet width decreases to 150 feet. The western end of this barrier beach was breached during the hurricane flood of September 1938. Subsequent storms have formed a large shoal at the mouth of the inlet, where the controlling depth has dwindled to 1.7 feet opposite the breach. The shoal now extends one mile upstream and is cut by a sinuous, narrow channel having depths of 2 to 3 feet. In the upper part of the river, depths of 6 to 11 feet are available over a 40-acre area extending 0.9 mile southward from the railroad bridge at Poquonock Bridge. Between the railroad bridge and the head of navigation, depths of 3 to 5 feet are reported.

8. The mean tidal range is 2.6 feet. The locality is shown on the U. S. Geological Survey New London quadrangle, on National Ocean Survey Charts 293, 358, 359, and 1,211, and on the maps accompanying this report.

TRIBUTARY AREA

9. The immediate tributary area is the southwestern portion of the town of Groton. Within the southwestern end of the town, there is the incorporated city of Groton which has a mayor and councilor form of government, while the outlying area is governed by a town council and selectmen. In 1970, the population of the town of Groton was 38,523; a 28.7 percent increase from the 1960 population of 29,937. The main industrial and business districts are located along the left bank of the Thames River, at the west side of the town. Submarine construction, nuclear research, and pharmaceuticals are the major industries.

10. Most of the frontage along the shores of Poquonock River is owned by the State and is relatively inaccessible by road. The State-owned Trumbull Airport, the principal airport in the eastern third of the State, occupies the east shore of Baker Cove and the west shore of Poquonock River upstream to the railroad bridge. On the east shore of the Poquonock River a 220-acre triangular area between Bushy Point and the former railroad crossing 0.6 mile south of Poquonock Bridge was purchased by the State in 1963 for future development of a "Bluff Point State Park". The adjoining shoreline between this former crossing and the existing railroad bridge is also undeveloped. A year-round residential area is located at the head of the river.

11. The western shore of Baker Cove along Jupiter Point is dotted with summer cottages, year-round residences, a small boatyard and a seafood market. Except for a few residences and summer cottages on Jupiter Point, the northern shore of Pine Island Bay is used for recreational boating facilities. The southeastern branch of the University of Connecticut is now established at the former Coast Guard training station at Avery Point, at the entrance to the bay, and is planning construction of additional facilities on Pine Island. Otherwise, the islands at the east side of the bay are undeveloped.

12. The area is served by several forms of transportation. Immediately to the westward, the 33-foot Federal channel in New London Harbor provides access for deep draft vessels. The Shore Line of the Penn Central Railroad, formerly the New York, New Haven and Hartford Railroad, crosses the Poquonock River 0.4 mile south of Poquonock Bridge. Connecting bus line service to New London and Norwich, Connecticut and Westerly, Rhode Island operates on U.S. Route 1, which passes through Poquonock Bridge at the head of the river inlet. Interstate Route 95 crosses the system of water supply reservoirs north of Poquonock Bridge. Two scheduled airlines and charter service are available at Trumbull Airport.

BRIDGES AND OTHER FACILITIES AFFECTING NAVIGATION

13. A fixed, single span, railroad bridge, conveying the Shore Line of the Penn Central Railroad crosses the river 0.4 mile south of the Poquonock Bridge. It has a horizontal clearance of 54 feet and a vertical clearance of 9.4 feet at mean high water. The structure was approved by the Secretary of War on 20 March 1916.

14. About 0.4 mile farther south, the deep water area opposite the airport is roughly bisected by the embankment of a former spur railroad line. Built in 1908, the track was removed in 1948 during a major expansion of the airport, providing a horizontal clearance of 53 feet between the remaining abutments. No navigation improvements have been considered upstream of the abandoned railroad bridge crossing.

15. A submarine telephone cable extends along the natural bottom from the northwest side of Avery Point to the northwest end of Pine Island, connecting auxiliary facilities on Pine Island with Avery Point. A 6-inch water main extends along the natural bottom from the foot of Jupiter Point Road to the north shore of Pine Island, except at the shore ends where it is buried about 3.5 feet. Installed for use by the U.S. Army Coast Artillery Corps these utilities were taken over by the Coast Guard after World War II but are not now actively used.

PRIOR REPORTS

16. No prior navigation reports have been made concerning the Poquonock River by the Federal Government or the State of Connecticut. A cooperative shore erosion control study of the conditions existing between 1949 and 1952 was made for Pine Island, Avery Point, Jupiter Point, Trumbull Airport, Bushy Point and Bushy Point Beach. It was found that no Federal benefits would result from protective measures in the Poquonock River area and no Federal participation was considered. Published as House Document 31, 83rd Congress, 1st Session, the report on this study entitled "Area 5, Pawcatuck River to Thames River, Connecticut Beach Erosion Control Study" recommended that local interests consider construction of a dumped-riprap mound along the west side of Jupiter Point for the protection of private property.

OTHER IMPROVEMENTS

17. No dredging improvements have been made by local interests other than periodic dredging of berth areas at the northwest side of Pine Island Bay. The U. S. Coast Guard maintains a light at Avery Point, a flashing bell buoy off the southern end of Pine Island, and two unlighted buoys to mark offshore rocks at either side of the inner approach to Pine Island Bay. No lights or buoys are maintained in the existing special anchorage in the northern half of Pine Island Bay inclosed by Avery and Jupiter Points.

TERMINAL AND TRANSFER FACILITIES

18. With the exception of a small launching ramp at the town-leased beach, there are no public landings or service facilities along the Poquonock River. A town-owned pier near the northwestern end of the railroad bridge is in poor repair and is no longer in use. A few private piers and a small livery pier are located near the railroad bridge.

19. Terminal facilities at Pine Island Bay, listed clockwise from the University of Connecticut Marine Biological Laboratory wharf at Avery Point, include the Shennecosset Yacht Club piers

and marine railway, a small marina, and a large marina and livery. The State Fisheries and Game Commission maintains a public launching ramp and parking area at the foot of Bayberry Lane, between the larger marina and Jupiter Point. The Avery Point and Pine Island piers are now restricted to use by marine research vessels. Facilities at Baker Cove consist of a small boatyard at the base of Jupiter Point and a seafood market pier, open to the public. The marina and boatyard establishments at both waterways build, repair, service and store boats up to 50 feet in length.

IMPROVEMENTS DESIRED

20. A public hearing was held in the City of Groton, Connecticut on 28 March 1960 to give local interests an opportunity to express their views on the need and desirability of navigation improvements by the Federal Government. The hearing was attended by 98 persons, including representatives of Federal, state and local governments and boating interests.

21. The following navigation improvements were requested by local officials, marine operators and boatmen:

a. An anchorage 7 feet deep over an area of 50 acres in Pine Island Bay;

b. Channel improvements in Baker Cove and an anchorage 6 feet deep and 50 acres in area in Baker Cover;

c. A channel in the Poquonock River having a depth of 6, 8 or 10 feet extending from deep water in Pine Island Bay about 7,800 feet upstream to deep water 0.3 mile south of the former railroad crossing opposite the town-leased beach;

d. Anchorage in the upstream reaches of the Poquonock River;

e. Breakwater protection for Pine Island Bay.

22. Subsequent to the public hearing and request for improvements, the navigation study was held up for a considerable length of time while studies were being made by the state to

determine the feasibility of expanding air traffic facilities at Trumbull Airport. Extension of the airport runway south-westerly would have precluded navigation development of Pine Island Bay and Baker Cove because of the physical extension as well as the vertical height restrictions imposed on the waterways. The recent Connecticut Department of Aeronautics' decision to substantially modify its plans for Trumbull Airport, permitted completion of the navigation study.

EXISTING AND PROSPECTIVE COMMERCE

23. No waterborne commerce has been reported in recent years. One lobster boat is based at Baker Cove but no expansion of the seafood market facility is anticipated.

VESSEL TRAFFIC

24. Traffic in all three waterways is almost entirely by recreational boating. Based on a net season of 160 days, it is estimated that existing craft make 18,000 round trips annually through the outer section of Pine Island Bay. About 390 boats base in the study area, of which 270 are in Pine Island Bay, 75 in Baker Cove and 45 in the upper reaches of the Poquonock River. About 160 of the Pine Island Bay fleet are berthed along the northern shore of the bay; the remaining 110 boats moor or anchor in the existing special anchorage in the northern half of the bay.

DIFFICULTIES ATTENDING NAVIGATION

25. The principal navigation difficulty is the lack of adequate channel depths in the Poquonock River. Navigation across the major shoal in the lower third of the river is difficult, even with extensive local knowledge of existing conditions. The controlling depth of 1.7 feet at mean low water limits use of the waterway by most craft during low tide periods. Several groundings were reported by boat owners at the public hearing and some have indicated that they no longer attempt to enter the river. Damages reported have been relatively small as the shoals consist primarily of mud and sand. Straightening and deepening of the sinuous natural channel would eliminate navigation delays and reduce grounding damages.

26. The natural channel in Baker Cove is relatively narrow and is located close to many of the piers along the western shore. Local knowledge is required when navigating at half tide or less.

27. Shallow depths in the northeastern section of the anchorage and exposure to southwesterly waves through the entrance are the main difficulties at Pine Island Bay. Sheltered anchorage exists in the lee of Pine Island but boat operators shun it because of rock and shoal areas.

WATER POWER AND OTHER SPECIAL SUBJECTS

28. Water power, water supply, or flood control matters are not pertinent to this tidal area. No pollution problems have been reported.

PROJECT FORMULATION

29. The navigation improvements requested by local interests as well as alternate plans of improvement were studied to determine if they would meet future navigational needs, be economically justified, and provide the maximum net benefits. The first step in the analysis was to estimate the future rate of expansion of the recreational boat fleet in the three main areas under study; Pine Island Bay, Baker Cove, and the Poquonock River. The entire area is located in a growing community and can expect to realize a substantial yearly expansion in recreational boating.

30. The request by local interests for improving Pine Island Bay by constructing a breakwater at the western entrance between Avery Point and Pine Island to provide a protected 40-acre anchorage within the bay was considered. The optimum breakwater structure would be 600 feet long with a crest elevation 6 feet above mean low water. Also, considerable dredging would be required to provide the desired 40-acre anchorage. Estimates were made of the costs for providing this plan. The breakwater would cost \$1,500,000 and the dredging would cost \$400,000. The annual costs far exceed the annual benefits expected from this plan. Therefore, further attention was directed to other alternatives.

31. It was found that about 23 acres of anchorage could be provided substantially in the lee of Avery Point and Pine Island, without the need to provide breakwater protection, by dredging various shoals in the bay having depths less than six feet. At present, there are approximately 160 boats using berths at Shennecosset Yacht Club and other marina and individual facilities located along the northerly side of Pine Island Bay. The remaining 100 locally based boats and 10 equivalent transient boats moor in the naturally deep spots throughout the bay. These latter 110 craft do not realize full use because of shoal areas.

32. Based on an average of 10 boats per acre (tide range - 2.6 feet; proposed depth 6 feet), the 23-acre anchorage could accommodate a total of 230 boats. Thus, with the 110 boats currently using the natural area, not without disadvantages, an additional fleet of 120 boats could be accommodated. It is estimated that 100 of these would be new craft and 20 would be attracted equivalent transient craft. It is further estimated that it would take approximately seven years for the anchorage to be fully occupied. This represents about a 6 percent per year growth factor, which is average for the Connecticut area. Any further expansion to accommodate boating would have to be provided by marina type facilities.

33. Local interests also requested a 50-acre anchorage in Baker Cove. However, the low elevation flight path to the runway at Trumbull Airport and the narrowness of a large portion of the cove, make such a large anchorage infeasible. The only suitable open water area with space for a anchorage development is at the head of the cove. A few acres of anchorage could be provided there but the anchorage would be rather remote from the developed facilities along the west shore of the cove. To reach the anchorage, as well as provide access for other facilities along the cove, a 100-foot wide access channel 3,900 feet long extending from Pine Island Bay to the head of Baker cove would be required. The need to maintain access to existing facilities bordering the west side and the restriction on the provision of facilities on the east, or Trumbull Airport side, effectively eliminates the possibility of providing strip anchorages adjacent to the main entrance channel.

34. Provision of a small anchorage at the head of the cove would not even accommodate the existing fleet of 75 locally based boats and 10 equivalent transient boats, to mention nothing concerning fleet expansion. These existing boats now are crowded together in what naturally deep water is available in the cove. Thus, the only feasible way of adequately providing for the existing and prospective fleets is by constructing a municipally owned and operated marina. Assuming average boat lengths of about 23 feet, about 40 boats per acre could be accommodated in berthing slips with an allowance for adequate access channels. It has been determined that a marina with initial capacity for 160 boats should be provided. This facility would accommodate the 85 existing boats and 85 additional craft. The marina would occupy about 4 acres of water area. Based on the same anticipated increase in boats as for Pine Island Bay, the facility would be filled in about 17 years. Both the existing and prospective boat fleets would benefit. Some limited additional water area would remain for further expansion if local interests so desire.

35. In the Poquonock River proper there are 45 locally based boats and about 10 equivalent transient craft. These boats are moored in a 15 acre naturally deep anchorage located just south of the embankments of a former railroad crossing. This mooring area cannot be substantially enlarged by dredging because of airport property on the west and state and privately owned property on the east. Based on a capacity of 10 boats per acre and allowing for 5 attracted equivalent transient boats, the naturally deep mooring area could accommodate a total additional fleet of 90 boats. This number of boats will be attained in about 27 years. The improvement considered for the Poquonock River would provide for a channel 6 feet deep and 100 feet wide extending upstream to the natural anchorage area. The channel would allow unrestricted use of the anchorage by all craft seeking access to the upper reaches. To assure channel stabilization and to reduce maintenance dredging, a low stone dike would be needed between Bushy Point and Bushy Point Beach. The total estimated cost to provide for these improvements is \$555,000. Annual benefits derived amount to about \$23,000, which are far from sufficient to justify the plan.

36. Thus, the naturally deep water anchorage is too small to economically support channel improvement. In order to justify adequate improvement, a 200-boat capacity marina would be needed, located adjacent to the natural anchorage. The Trumbull airport occupies the land area surrounding the northerly side of the river, effectively closing off public access for marina development. The southerly side of the river is chiefly under the ownership of the Connecticut State Park and Forest Service, as part of Bluff Point State Park. The Park Service at the present time has no plans to construct a small boat marina on the State Park property. Private ownership of the remaining portion of the shore precludes marina development of sufficient size. Town officials have stated that there is no prospect of developing a marina in this area under existing conditions. Based on this situation no further consideration was given to developing an improvement plan for Poquonock River proper.

PLANS OF IMPROVEMENT

37. The three water bodies comprising the Poquonock River area of Groton, Connecticut have inadequate depths and anchorage space to enable full use of these water areas by existing and prospective recreational fleets. Various proposed plans were examined to determine the most economical method of meeting the boating needs. Plans of improvement were considered for each of the three contiguous water bodies and plans developed for Pine Island Bay and Baker Cove.

38. The plan of improvement developed for Pine Island Bay would provide for 13 acres in the northerly portion and 10 acres in the southerly portion of the bay, both to a depth of 6 feet. To service these anchorages, entrance channels east and west of Pine Island 150 feet wide at the entrance decreasing to 100 feet around the northern anchorage and between the two anchorages, all to a depth of 6 feet would be required. Located in the lee of Avery Point and Pine Island, this plan would provide anchorage for 230 boats and improved access to existing facilities along the northern shore.

39. The plan of improvement developed for Baker Cove consists of a channel 6 feet deep, 100 feet wide and 900 feet long through the shallow northeastern end of Pine Island Bay, joining a channel of similar dimensions extending about 3,000 feet into Baker Cove. It includes a small turning basin at the head of the channel to service a required 160-boat capacity marina. The approach channel would also service all existing piers along the eastern shore of Jupiter Point.

REQUIRED AIDS TO NAVIGATION

40 The Third Coast Guard District has been consulted and has advised that aids to navigation will be required. For the plans of improvement mentioned above it is estimated that the aids would cost a total of \$2,975, with \$256.72 annually for maintenance.

ESTIMATES OF FIRST COSTS

41. Federal construction of the proposed improvement projects would involve the removal and disposal of ordinary materials to provide for channels and anchorage areas at Pine Island Bay and an access channel to the head of Baker Cove. Local interests would be responsible for dredging berthing areas, and minor channels in the marina development. The U. S. Coast Guard would provide necessary navigation aids. The estimate is based on removal of material by hydraulic dredging with disposal of spoil on Bushy Point Beach. Dredging quantities are in terms of in-place measurement, with one foot over depth and 1 on 3 side slopes. Detailed estimates of cost for each plan are shown in TABLE 1.

TABLE I - ESTIMATED FIRST COSTS

CONSIDERED IMPROVEMENT	PINE ISLAND BAY	BAKER COVE
Channel (size)	6' x 100' x 3,850'	6'x100'x3,900'
Anchorage (size)	23 acres	
Quantity	82,700 cu. yd.	92,300 cu. yd.
Unit Cost	\$3.00	\$3.00
Basic Cost	\$248,100	\$276,900
Contingencies	<u>\$37,200</u>	<u>\$41,600</u>
Construction Cost	\$285,300	\$318,500
Engrg. & Design	\$23,200	\$25,500
Supervision & Admin.	\$20,000	\$22,000
Construction Cost	\$328,500	\$366,000
Navigation Aids	\$1,500	\$1,500
TOTAL FIRST COST	\$329,000	\$367,500

ESTIMATE OF BENEFITS

42. The annual benefits attributable to the proposed plan of improvement at Pine Island Bay would be about \$64,700. The annual benefits for the proposed plan of improvement at Baker Cove would amount to \$38,200. The benefits are itemized and further detailed in APPENDIX A.

APPORTIONMENT OF COSTS AMONG INTERESTS

43. The estimated costs for the plans of improvement are apportioned between Federal and local interests in accordance with the percentage of general and local benefits to be derived. Recreational benefits are divided equally between Federal and local interests. The cost of providing public landings, berthing space and marina facilities are considered to be local self-liquidating expenses. The first costs of construction of the considered improvements are apportioned as 50 percent Federal and 50 percent local, as shown in TABLE 2.

TABLE 2

	PINE ISLAND BAY	BAKER COVE
<u>Federal Investment</u>		
Corps of Engineers	\$164,250	\$183,000
U. S. Coast Guard	<u>1,500</u>	<u>1,500</u>
TOTAL FEDERAL	\$165,750	\$184,500
<u>Non-Federal Investment</u>		
Cash Contribution	\$164,250	\$183,000
Public Landing	20,000*	----
Marina	<u>---</u>	<u>200,000*</u>
TOTAL NON-FEDERAL	\$184,250	\$383,000

*Self-liquidating costs

ESTIMATE OF ANNUAL CHARGES

44. Annual charges are based on an estimated project life of 50 years and an interest rate of 5 3/8% for both Federal and non-Federal charges. The non-Federal investment has been based on apportionment of costs commensurate with local benefits. A cash contribution of 50 percent of the first cost of construction should be required of local interests for the Federal project. The estimate for maintenance dredging costs in the channels and anchorages are based on past experience in shoaling rates of similar areas.

45. Construction of the public landing, berthing areas, and marina structures including maintenance of these facilities are considered self-liquidating through user charges and are not included in the estimate of annual charges. Annual charges are shown on TABLE 3.

TABLE 3 - ANNUAL CHARGES

ITEM	PINE ISLAND BAY	BAKER COVE
Interest (0.05375)	\$ 17,700	\$ 19,650
Amortization (0.00425)	1,400	1,550
Total Interest & Amortization	19,100	21,200
<u>Maintenance</u>		
Dredging	5,000	4,500
Stone Work	---	---
Navigation Aids	150	150
TOTAL ANNUAL CHARGES	\$ 24,250	\$ 25,850

COMPARISON OF BENEFITS AND ANNUAL COSTS

46. Comparison of the evaluated benefits of \$64,700 and annual charges of \$24,250 indicates a benefit-cost ratio of 2.7 to 1.0 for the proposed improvement of Pine Island Bay. At Baker Cove the annual benefits total \$38,200 with annual charges of \$25,850 resulting in a B/C ratio of 1.5 to 1.0.

PROPOSED LOCAL COOPERATION

47. Because the benefits to be derived from improvement of Pine Island Bay and Baker Cove are considered to be 50 percent general and 50 percent local in nature, local interests would be required to provide a cash contribution of 50 percent of the construction cost of each of the recommended improvements. They would also be required to perform or contribute the cost of performance of, that part of the maintenance of the project allocable to recreation. Additional standard items of local cooperation are listed below:

a. Provide, maintain and operate without cost to the United States a public landing adjacent to the Pine Island Bay anchorage. The landing should include access roads, adequate parking facilities, dredged berthing areas commensurate to the depth of the Federal project, and other necessary public use shore facilities, open to all on equal terms.

b. At Baker Cove local interests should be required to provide a marina facility with a capacity for 160 boats, including berthing areas and access channels with depths commensurate to the Federal channel. These facilities should be open to all on equal terms.

c. Provide without cost to the United States all lands, easements and rights-of-way required for construction and subsequent maintenance of the project, including suitable areas required for disposal of spoil with the necessary retaining dikes, bulkheads, and embankments thereof or the cost of such retaining works.

d. Hold and save the United States free from damages due to the construction and subsequent maintenance.

e. Regulate the use and development of the waterways including prohibiting discharge of pollutants in the waters of Pine Island Bay and Baker Cove by users thereof in accordance with applicable laws and regulations of Federal, state and local authorities responsible for pollution prevention control.

COORDINATION WITH OTHER AGENCIES

48. All Federal, state and local agencies having an interest in the navigation improvements were notified of the public hearing held in Groton on 28 March 1960. The U.S. Fish and Wildlife Service has submitted a conservation and development report. See APPENDIX B. The U. S. Coast Guard letter concerning aids to navigation is inclosed in APPENDIX C.

DISCUSSION

49. The lower reach of the Poquonock River and the bodies of water contiguous to its mouth, Baker Cove and Pine Island Bay, provide limited anchorage areas for recreational boating interests. Under existing conditions, navigation in the entire waterway is difficult, even with knowledge of the area. The channel in Baker Cove is located close to many piers extending out from the western shore, while shoals and sharp bends form other hazards. Shallow depths and exposure to wave action from the southwest limits the use of the existing anchorage in Pine Island Bay. Rocks and shoals prevent safe anchorage in the lee of Pine Island. Boat owners do not get full use of their boats because of crowded conditions.

50. In order to alleviate the condition local interests requested Federal assistance in developing new anchorage areas and channel improvements in Pine Island Bay, Baker Cove and Poquonock River, including a breakwater to protect Pine Island Bay. The requested improvements were studied to determine economic justification. Estimates of costs and benefits for various plans were

made. Results of the study indicate that improvement of Pine Island Bay could be accomplished by dredging a 13-acre anchorage in the northern part of the harbor and a 10-acre anchorage in the southern portion, both to a depth of 6 feet; and a channel 100 feet wide, 6 feet deep between the anchorages, leading to the entrance of Poquonock River from the west and a channel of similar dimensions providing necessary access to the marine biological laboratory main pier, the yacht club, two marinas, and the public launching ramp facilities along the north shore of Pine Island Bay. The total first cost of construction for this improvement is estimated to be \$329,000, the annual charges amounting to \$24,250. Annual benefits resulting from providing additional anchorage space for 230 existing and new boats amount to \$64,700. This yields a benefit-cost ratio of 2.7 to 1.0.

51. A plan of improvement for Baker Cove was developed which would provide a channel 6 feet deep, 100 feet wide, 900 feet long through the northeastern end of Pine Island Bay, joining a channel of similar dimensions extending about 3,000 feet into Baker Cove. At the head of the channel in Baker Cove it would be necessary for local interests to construct a 160 boat capacity marina to accommodate the existing recreational fleet of 75 locally based boats and 10 equivalent transients. The remaining berths would provide sufficient space for expansion of the fleet by 75 new boats and would probably be filled in 17 years at the present rate of growth. Dredging of the major access channel from Pine Island Bay to the head of the Cove is presently estimated to cost \$367,500 at an annual cost of \$25,850. Benefits expected to result from the considered improvement total \$38,200 annually. This entire improvement is predicated on development of a marina facility at the head of the cove which should include a public landing open to all on equal terms. There is considerable interest in a marina development at this site by private enterprise provided suitable access is made available.

52. Improvement of the Poquonock River channel leading from Pine Island Bay to the naturally deep 15 acre anchorage in the upper third of the river was also considered. It was found that without the additional benefit of a 200-boat capacity marina, the number of boats that the anchorage could hold would not provide sufficient benefits to justify improvement. The Connecticut State

Park Service has no plans to provide a marina within Bluff State Park and town officials have been unable to obtain enough interest by local residents outside the park to provide space for marina development.

53. Because the navigation improvements economically justified for Pine Island Bay and Baker Cove are solely for the benefit of recreational craft, local interests would be required to provide a cash contribution of 50 percent of the first cost for construction, currently estimated to be \$164,250 for the Pine Island Bay improvement and \$183,000 for Baker Cove. This cost share toward the considered Federal navigation improvements does not include the cost of construction for a public landing at Pine Island Bay or a marina in Baker Cove.

54. In the spring of 1969 the town of Groton indicated that the Federal navigation improvements in Pine Island Bay and Baker Cove as described in this report would be eliminated through the town's cooperation with the newly created Connecticut Department of Community Affairs in development of a master plan for land and harbor improvement. Preliminary plans for the entire area under consideration would:

- a. Include a city street and park development on the lower west bank of Birch Plain Creek;
- b. Relocate a state highway at the Penn Central Railroad crossing at the head of Baker Cove, to eliminate the traffic bottleneck at the railroad underpass.
- c. Construct a culvert under the railroad crossing large enough to provide passage for canoes and small boats into Birch Plain Creek from Baker Cove;
- d. Dredge anchorages and channels north of Pine Island;
- e. Close the breach between Bushy Point Beach and Bushy Point, work to be conducted by the Connecticut Park and Forest Commission as part of development of Bluff Point State Park;

f. Construct breakwaters on each side of the entrance between Pine Island and Bushy Point;

g. Construct a causeway across the opening between Avery Point and Pine Island;

h. Develop a University of Connecticut Marine Biological Laboratory and recreation park on Pine Island.

55. Officials of Groton decided to take action on their part of these proposals before July 1969 in order to receive state aid and funding under the Community Development Act of 1967. Since that time the Community Action Development Plan for Groton has been revised and does not include any provision for harbor development as originally intended. At a meeting held in Groton on 16 February 1972 town officials stated that the Shennecossett Yacht Club plans to expand berthing facilities into Pine Island Bay on a large scale in the near future. The extent of this development depends upon construction of a causeway across the waterway from Avery Point to Pine Island. The causeway would give protection to the entire Bay from the southwest direction. Also, the Groton Elks Club has shown an interest in building a marina at the head of Baker Cove. At the meeting, town officials indicated that the Town is not in a position to meet requirements of local cooperation for the proposed Federal improvements at either Pine Island Bay or Baker Cove at this time. They claim that the Town would be unable to acquire the necessary public land access for marinas at Baker Cove or Poquonock River in the near future. The only access for a public landing at Pine Island Bay which might be available would be through the Shennecossett Yacht Club. However, use of this site for public access does not appear to hold much promise at this time.

CONCLUSIONS

56. The Division Engineer finds that the existing anchorages in Pine Island Bay, Baker Cove, and Poquonock River are inadequate in area and depth to accommodate the existing and expected increase in recreational boating activity. Improvements are needed in these areas, to realize their full boating potential. Economically justified plans have been developed for Federal participation in anchorage and channel improvements in Pine

Island Bay and Baker Cove. The available deepwater anchorage in the upper end of Poquonock River is too small and too far upstream to warrant the extensive dredging required for an entrance channel without the added benefit of a marina.

57. Local officials realize that improvement is definitely needed but have indicated that more time is needed to acquire the necessary backing to meet the requirements of local cooperation for a Federal project, specifically public access to Pine Island Bay and suitable marina developments in Baker Cove and Poquonock River. They are also in a quandary as to the most advantageous development of the waterway in Pine Island Bay. Therefore, it is concluded that no Federal participation in navigation improvements is warranted at this time.

RECOMMENDATIONS

58. In view of the above situation, the Division Engineer recommends no Federal navigation improvement in the vicinity of Poquonock River, Groton, Connecticut at this time.

5 Incl

1. 3 Maps, Plates 1, 2, and 3

2. Appendix A - Estimates of
Benefits

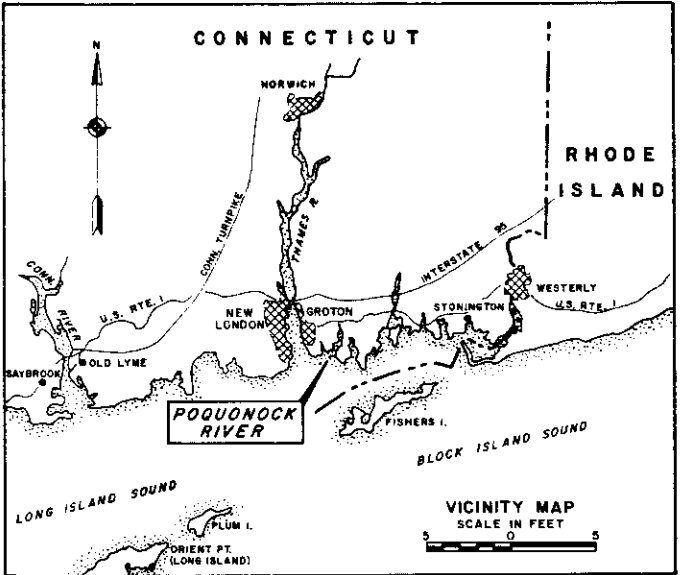
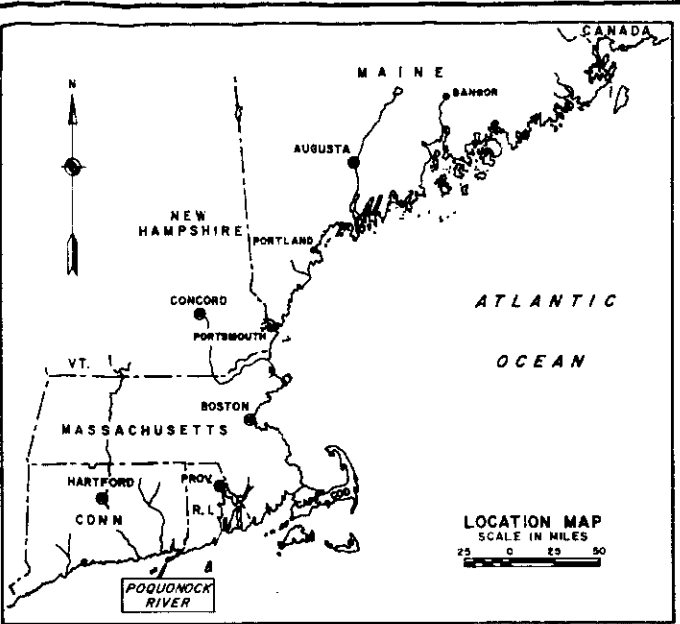
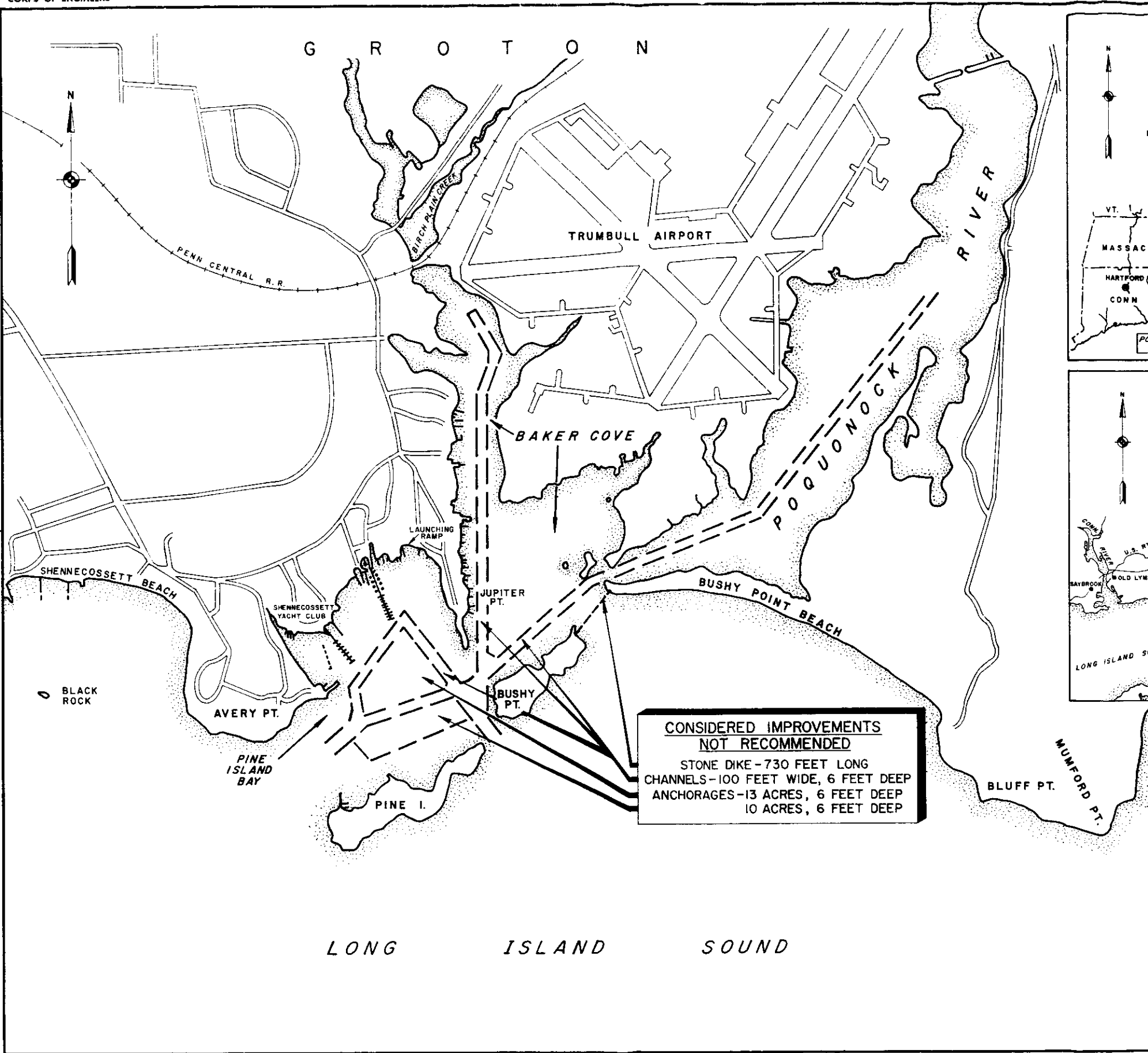
3. Appendix B - U.S.F. & W.S. Report

4. Appendix C - U.S.C.G. Letter

5. Info. - Sen. Res. 148

FRANK P. BANE

Colonel, Corps of Engineers
Division Engineer



REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

**POQUONOCK RIVER
GROTON, CONN.
GENERAL MAP**

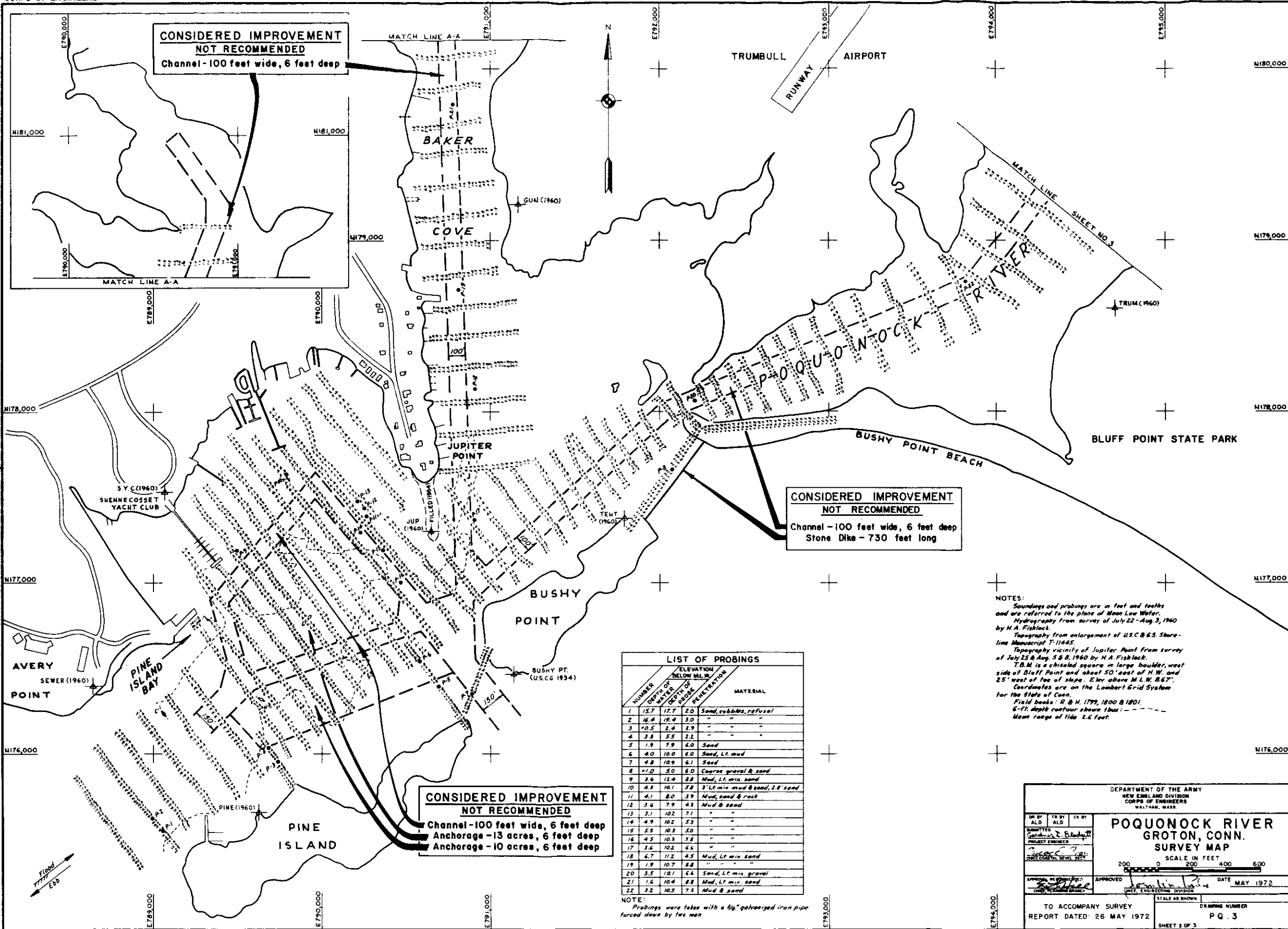
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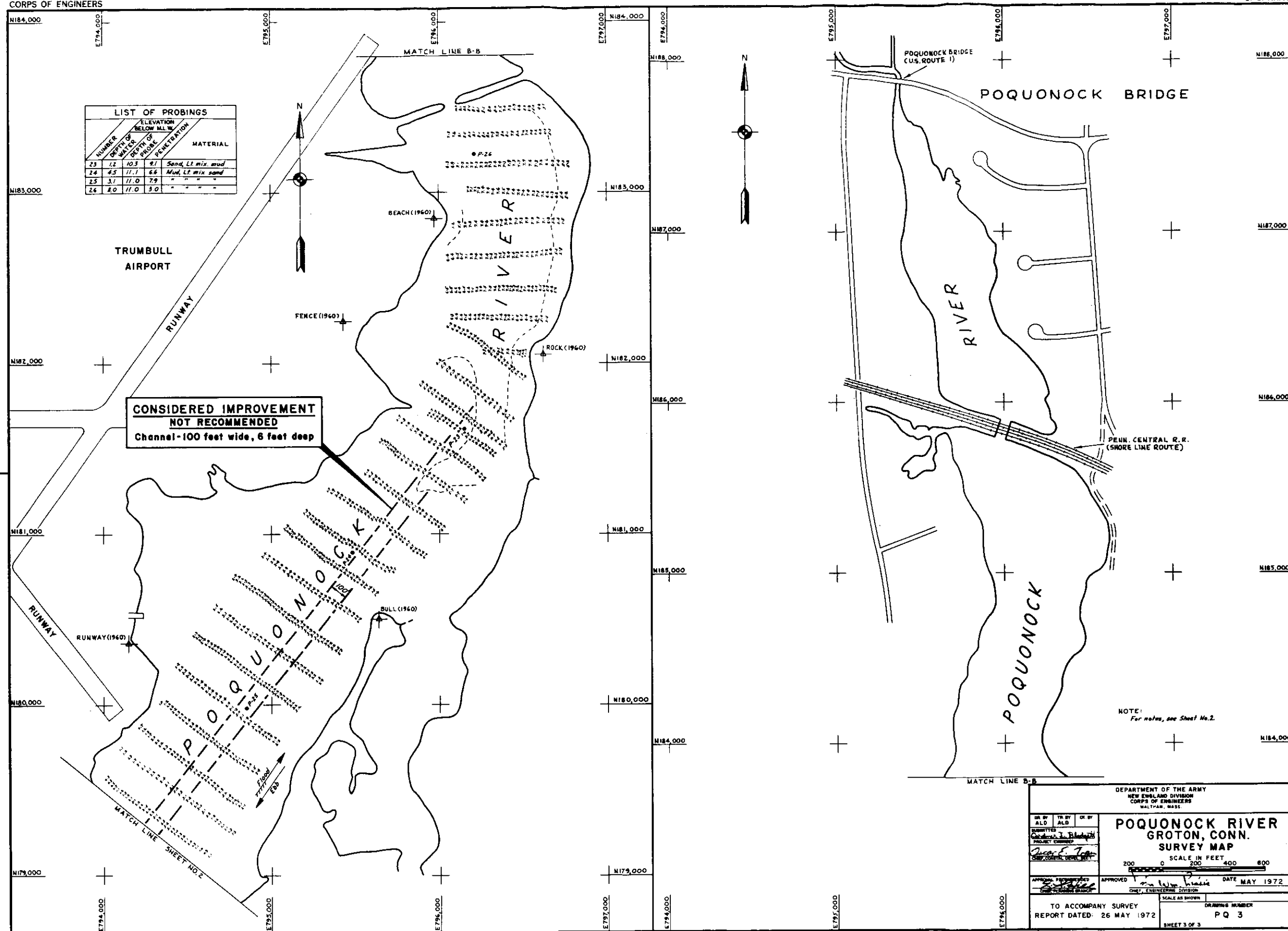
DATE MAY 1972

TO ACCOMPANY SURVEY
REPORT DATED 26 MAY 1972

DRAWING NUMBER
PQ. 3

SHEET 1 OF 3





APPENDIX A

SURVEY OF POQUONOCK RIVER, GROTON, CONNECTICUT

ESTIMATES OF BENEFITS

1. Improvement of the Poquonock River area would result in substantial benefits to the existing and prospective recreational fleet. Benefits to these interests would be realized through safe and ready access, additional mooring areas, and increased efficiency of operation. Benefits will also accrue from improved accommodations for transient pleasure craft.
2. Recreational benefits have been computed on the basis of annual net return to the owners, if the boats were "for hire". This net return varies with the size and type of boat and is expressed in terms of its average depreciated value. The ideal net return is considered the maximum return that could be obtained with full unrestricted use of the area. For this particular harbor, the ideal net return varies from 14 percent for the smaller boats to 8 percent for the large craft. This variation in the ideal percentage is based on the length of season, concentration of population, costs of alternative type of outdoor recreation and income range of the using public. An estimate was made of the percent of optimum use which could be received under the proposed improvement. The difference or gain between the two conditions was considered to be the benefit. A net gain in percent return was taken for shallow draft outboards as well as the larger cruisers, because of the lack of adequate depth and restricted mooring conditions.
3. The existing locally based recreational fleet at Pine Island Bay that would benefit from improvement consists of 100 boats moored in sufficient but somewhat exposed natural depths of water in the Bay. By provision of access channels and adequate mooring space in a sheltered area these boats are expected to receive annual benefits in the amount of \$6,700. (see TABLE I)
4. Over 800 transient craft visit the Pine Island Bay area each boating season for an average stopover of 2 days. With

a boating season of 160 days, this amounts to 1,600 boat-days or an equivalent of 10 locally based boats. It is considered that these boats would receive the same net return as the local fleet. The benefits from this source would amount to \$1,100 annually. (see TABLE 2) Local interests believe that provision of additional anchorage area would at least triple the present number of transient craft attracted to the area. This would be equivalent to 20 locally based boats. Annual benefits for future transient craft are estimated at \$10,000. (see TABLE 3)

5. The Pine Island Bay anchorages as proposed would provide a total mooring space for 230 boats. Deducting space in the anchorages for the 130 boats as indicated above would leave 100 spaces for new boats expected to be added to the locally based fleet. At the present rate of growth the anchorage would be filled in about 7 years through the purchase of new boats. The annual benefits for these future boats is estimated to be \$46,900. (see TABLE 4)

6. Improvement of Baker Cove would result in similar benefits as those projected for Pine Island Bay. Due a lack of sufficient space in the cove to provide open anchorage it would be necessary to berth the boats in a marina. To offset the cost of channel improvement and to meet the expected future growth of boating in Baker Cove, local interests should initially provide space for 160 boats. The benefits expected to accrue to recreational boats at this site are derived on the same basis as Pine Island Cove. There are 75 locally based boats which would receive \$6,900 annual benefits. (see TABLE 5) The 10 existing equivalent transients would benefit in the amount of \$1,400. (see TABLE 6) It is expected that the number of transient craft would also triple at this site, but would limit their visits to only one day due to the added time involved in travelling from off-shore cruising areas. The annual benefit would amount to \$4,300 (see TABLE 7) A marina with initial space for 160 boats would have 65 spaces available for expansion of the local fleet. Assuming that the present rate of boating increase would continue, the marina would be filled in 17 years. The average annual benefit derived from the new boat expansion of the fleet would amount to \$25,600. (see TABLE 8) It is considered that investment in a larger marina at the outset would not be to

the advantage of local interests since projected increases in boating activity depend on changes in economic factors. A smaller marina would not provide sufficient benefits to justify channel improvement at this time.

7. The foregoing benefits are summarized below:

SUMMARY OF ANNUAL BENEFITS

<u>Source</u>	<u>Pine Island Bay</u>	<u>Baker Cove</u>
Existing Locally Based Fleet	\$ 6,700	\$ 6,900
Existing Equivalent Transients	1,100	1,400
Prospective Equivalent Transients	10,000	4,300
Prospective New Boats	<u>46,900</u>	<u>25,600</u>
TOTAL ANNUAL BENEFITS	\$64,700	\$38,200

TABLE 1 - BENEFITS TO RECREATIONAL BOATING

Existing Fleet - Locally Based

HARBOR: Pine Island Bay

160 Day Season

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE		PERCENT RETURN				VALUE \$	ON CRUISE			
			AVERAGE	TOTAL	Ideal	% of Ideal	Gain	Avg. Days		% of Season	Value \$		
			\$	\$		Pres.	Fut.						
RECREATIONAL FLEET													
Outboards	15-20	55	2400	132,000	14	80	95	2.1	2,772				
Inboards	15-20	7	4500	31,500	12	80	95	1.8	567				
	21-30	3	6300	18,900	11	75	95	2.2	416				
Sterndrive	15-20	8	3750	30,000	12	80	95	1.8	540				
	21-25	5	6000	30,000	11	75	95	2.2	660				
Cruisers	21-30	8	8300	66,400	9	75	95	1.8	1,195	14	9	108	
Aux. Sail	15-20	3	2600	7,800	9	80	95	1.4	109				
	21-30	3	7300	21,900	8	75	95	1.6	350	8	5	17	
Sailboats	8-15	4	1200	4,800	12	80	95	1.8	86				
	16-20	4	2100	8,400	12	80	95	1.8	151				
TOTALS		100		\$351,700					\$6,846			\$125	
											\$6,721		
										SAY	\$6,700		

TABLE 2 - BENEFITS TO RECREATIONAL BOATING

Existing Equivalent Transient Fleet

HARBOR: Pine Island Bay

160 Day Season

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE		PERCENT RETURN			VALUE \$	ON CRUISE		
			AVERAGE	TOTAL	Ideal	% of Ideal	Gain		Avg. Days	% of Season	Value
			\$	\$		Pres.	Fut.				\$
<u>RECREATIONAL FLEET</u>											
Inboards	15-20	1	4,500	4,500	12	80	95	1.8	81		
	21-30	1	6,300	6,300	11	75	95	2.2	139		
Sterndrive	15-20	3	3,750	11,250	12	80	95	1.8	203		
	21-25	2	6,000	12,000	11	75	95	2.2	264		
Cruisers	21-30	3	8,300	24,900	9	75	95	1.8	448		
TOTALS		10		\$58,950					\$1,135		
								SAY	\$1,100		

TABLE 3 - BENEFITS TO CRECREATIONAL BOATING

Prospective Equivalent Transient Fleet

HARBOR: Pine Island Bay

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE		PERCENT RETURN				VALUE \$	ON CRUISE		
			AVERAGE	TOTAL	Ideal	% of Ideal		Gain		Avg. Days	% of Season	Value \$
			\$	\$		Pres.	Fut.					
RECREATIONAL FLEET												
Inboards	15-20	4	4,500	18,000	12	0	95	11.4	2,052			
	21-30	4	6,300	25,200	11	0	95	10.5	2,646			
Sterndrive	15-20	4	3,750	15,000	12	0	95	11.4	1,710			
	21-25	4	6,000	24,000	11	0	95	10.5	2,520			
Cruisers	21-30	4	8,300	33,200	9	0	95	8.6	2,855			
TOTALS		20		\$115,400					\$11,783			

Average Annual Equivalent (7 yrs) = (\$11,800 x 0.848) = \$10,000 SAY \$10,000

TABLE 4 - BENEFITS TO RECREATIONAL BOATING

Prospective New Fleet

HARBOR: Pine Island Bay

160 Day Season

TYPE OF CRAFT	LENGTH (feet)	NO. of Boats	DEPRECIATED VALUE		PERCENT RETURN				VALUE \$	ON CRUISE		
			AVERAGE	TOTAL	Ideal	% of Ideal		Gain		Avg. Days	% of Season	Value \$
			\$	\$		Pres.	Fut.					
RECREATIONAL FLEET												
Outboards	15-20	50	2,400	120,000	14	0	95	13.3	15,960			
Inboards	15-20	4	4,500	18,000	12	0	95	11.4	2,052			
	21-30	4	6,300	25,200	11	0	95	10.5	2,646			
	31&Up	2	16,000	32,000	10	0	95	9.5	3,040			
Sterndrive	15-20	4	3,750	15,000	12	0	95	11.4	1,710			
	21-25	4	6,000	24,000	11	0	95	10.5	2,520			
	26&Up	2	12,000	24,000	10	0	95	9.5	2,280			
Cruisers	21-30	6	8,300	49,800	9	0	95	8.6	4,283	14	9	385
	31-40	4	21,000	84,000	8	0	95	7.6	6,384	19	12	766
	41-50	4	45,000	180,000	8	0	95	7.6	13,680	32	20	2,736
Aux. Sail	15-20	3	2,600	7,800	9	0	95	8.6	671			
	21-30	3	7,300	21,900	8	0	95	7.6	1,664	8	5	831
Sailboats	8-15	2	1,200	2,400	12	0	95	11.4	274			
	16-20	4	2,100	8,400	12	0	95	11.4	958			
	21-25	4	3,000	12,000	11	0	95	10.5	1,260	8	5	63
TOTALS		100		\$624,500					\$59,382			\$4,033

\$55,349 SAY \$55,350

Average Annual Equivalent (7 yrs) = (\$55,350 x 0.848) = \$46,936 SAY \$46,900

TABLE 5 BENEFITS TO RECREATIONAL BOATING

Existing Fleet - Locally Based

HARBOR: Baker Cover

160 Day Season

TYPE OF CRAFT	LENGTH (feet)	No. Of BOATS	DEPRECIATED VALUE		PERCENT RETURN				VALUE \$	ON-CRUISE			
			Average \$	Total \$	Ideal	% of Ideal		Gain		Avg. Days	% of Season	Value \$	
						Pres.	Fut.						
RECREATIONAL FLEET													
Outboards	15-20	45	2,400	108,000	14	80	100	2.8	3,024				
Inboards	15-20	5	4,500	22,500	12	80	100	2.4	640				
	21-30	3	6,300	18,900	11	75	100	2.8	529				
Sterndrive	15-20	6	3,750	22,500	12	80	100	2.4	640				
	21-25	5	6,000	30,000	11	75	100	2.8	840				
Cruisers	21-30	5	8,300	41,500	9	75	100	2.3	955	14	9	85	
Aux. Sail	15-20	2	2,600	5,200	9	80	100	1.8	94				
	21-30	1	7,300	7,300	8	75	100	2.0	156	8	5	8	
Sailboats	8-15	2	1,200	2,400	12	80	100	2.4	58				
	16-20	1	2,100	2,100	12	80	100	2.4	50				
TOTALS		75		\$260,400					\$6,986				\$93

\$6,986 - \$93 = \$6,893

SAY \$6,900

TABLE 6 BENEFITS TO RECREATIONAL BOATING

Existing Equivalent Transient Fleet

HARBOR:

TYPE OF CRAFT	LENGTH (feet)	No. Of BOATS	DEPRECIATED VALUE		PERCENT RETURN				VALUE \$	ON CRUISE		
			Average \$	Total \$	Ideal	% of Ideal		Gain		Avg. Days	% of Season	Value \$
						Pres.	Fut.					
RECREATIONAL FLEET												
Outboards	15-20	2	2,400	4,800	14	80	100	2.3	134			
Inboards	15-20	2	4,500	9,000	12	80	100	2.4	216			
	21-30	3	6,300	18,900	11	75	100	2.8	529			
Sterndrive	21-25	1	6,000	6,000	11	75	100	2.8	168			
6-A Cruisers	21-30	2	7,300	14,600	9	75	100	2.3	336			
TOTALS		10		\$53,300					\$1,383			
SAY									\$1,400			

TABLE 7 BENEFITS TO RECREATIONAL BOATING

Prospective Equivalent Transient Fleet

HARBOR: Baker Cove

TYPE OF CRAFT	LENGTH (feet)	No. Of BOATS	DEPRECIATED VALUE		PERCENT RETURN				VALUE \$	ON CRUISE		
			Average	Total	Ideal	% of Ideal	Gain	Avg. Days		% of Value Season	\$	
			\$	\$		Pres.	Fut.					
<u>RECREATIONAL FLEET</u>												
Sterndrive	15-20	2	3,750	7,500	12	0	100	12.0	900			
	21-25	4	6,000	24,000	11	0	100	11.0	2,640			
Cruisers	21-30	4	8,300	33,200	9	0	100	9.0	3,088			
TOTALS		10		\$64,700					\$6,628	SAY \$6,600		

Average Annual Equivalent (17 yrs) - (\$6,600 x 0.654) = \$4,320 SAY \$4,300

A-10

TABLE 8 BENEFITS TO RECREATIONAL BOATING

Prospective New Fleet

HARBOR: Baker Cove

160 Day Season

TYPE OF CRAFT	LENGTH (feet)	No. Of BOATS	DEPRECIATED VALUE		PERCENT			RETURN	VALUE \$	ON-CRUISE			
			Average \$	Total \$	Ideal	% of Ideal		Gain		Avg. Days	% of Season	Value \$	
						Pres.	Fut.						
RECREATIONAL FLEET													
Outboards	15-20	34	2,400	81,600	14	0	100	14.0	11,424				
Inboards	15-20	3	4,500	13,500	12	0	100	12.0	1,620				
	21-30	2	6,300	12,600	11	0	100	11.0	1,386				
	31&Up	1	16,000	16,000	10	0	100	10.0	1,600				
Sterndrive	15-20	2	3,750	7,500	12	0	100	12.0	900				
	21-25	3	6,000	18,000	11	0	100	11.0	1,980				
	26&Up	1	12,000	12,000	10	0	100	10.0	1,200				
Cruisers	21-30	2	8,300	16,600	9	0	100	9.0	1,494	14	9	134	
	31-40	4	21,000	84,000	8	0	100	8.0	6,720	19	12	806	
	41-50	3	45,000	135,000	3	0	100	8.0	10,800	32	20	2,160	
Aux. Sail	15-20	2	2,600	5,200	9	0	100	9.0	468	-	-	-	
	21-30	2	7,300	14,600	8	0	100	8.0	1,168	8	5	58	
Sailboars	8-15	1	1,200	1,200	12	0	100	12.0	144	-	-	-	
	16-20	3	2,100	6,300	12	0	100	12.0	756	-	-	-	
	21-25	2	3,000	6,000	11	0	100	11.0	660	8	5	33	
TOTALS		65		\$430,100					\$42,320			\$3,191	

Average Annual Equivalent (17 yrs) = \$39,129 x 0.654 = \$25,600

APPENDIX B



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

U. S. POST OFFICE AND COURTHOUSE
BOSTON, MASSACHUSETTS 02109

November 24, 1969

Division Engineer
New England Division
U. S. Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

This is our conservation and development report on the study of navigation improvements for Pine Island Bay, Baker Cove and the Poquonock River, Groton, (New London County), Connecticut. The study was made under authority of Section 112 of the River and Harbor Act of July 3, 1958. Our report was prepared under authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-666 inc.), in cooperation with the Connecticut Board of Fisheries and Game and Connecticut Shell Fish Commission and has their concurrence as indicated by letters dated November 10, 1969 and November 5, 1969, respectively. It has also been coordinated with and represents the views of the Bureau of Commercial Fisheries.

We understand that the project consists of access channels, a 23-acre mooring basin in Pine Island Bay, and a 7-acre mooring basin in Baker Cove, dredged to a depth of six feet below mean low water. The study also included deposition of spoil from Pine Island Bay and Baker Cove, totaling about 200,000 cubic yards, at the western end of Bushy Point Beach. Although this project has been found to be economically feasible, we understand that the lack of sponsor interest at this time has halted further consideration of Federal navigation improvements. We also understand that the State of Connecticut and the City of Groton are considering joint participation in a recreational project of much broader scope.

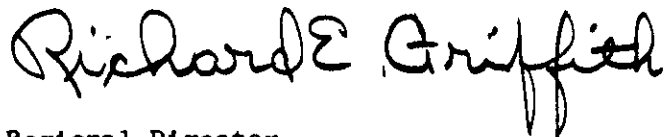
There is moderate use of the Pine Island Bay area by waterfowl, but hunting is limited because of the rather extensive dockside development. Baker Cove, however, provides good waterfowl habitat along the marsh fringes and

hunting is not restricted. Winter flounder is the principal sport-fish species in the river and provides some fishing. Soft clams, hard clams, and blue crabs are present, but not in sufficient numbers to provide a significant shell fishery. Eel grass beds are relatively abundant throughout the Bay, particularly in Baker Cove. The State Board of Fisheries and Game maintains access facilities consisting of boat launching ramp and parking area on the bay.

If navigation improvements for the study area are considered at a future date, we would appreciate being advised in sufficient time to determine the effects of any project plans on fish and wildlife resources.

We appreciate the opportunity to report on this project.

Sincerely yours,

A handwritten signature in cursive script that reads "Richard E. Griffith". The signature is written in dark ink and is positioned above the typed name.

Regional Director

APPENDIX C

TREASURY DEPARTMENT
UNITED STATES COAST GUARD

ADDRESS REPLY TO:
COMMANDER
3RD COAST GUARD DISTRICT
U.S. CUSTOM HOUSE
NEW YORK 4, N.Y.



0-1
3260
15 July 1964

From: Commander, Third Coast Guard District
To: U. S. Army Engineer Division, New England
Corps of Engineers
424 Trapelo Road
Waltham 54, Mass.

Subj: Navigation Study at Pine Island Bay, Groton, Conn.

Ref: (a) Corps of Engineers ltr NEDED-R dtd 20 June 1964

1. The Third Coast Guard District has no objection to the proposed mooring basin at Pine Island Bay. A copy of your letter has been forwarded to the Commanding Officer, U. S. Coast Guard Training Station, Groton, Conn., for comment.

2. In accordance with the request contained in paragraph 2 of reference (a), you are advised that the proposed Pine Island Bay Project will require the following aids to navigation:

5 ea 5th class can buoys \$2975.00

Annual maintenance would be 256.72 thereafter

3. The above estimates are approximate and subject to change.


J. MAZZOTTA
By direction

POQUONOCK RIVER, GROTON, CONNECTICUT

Information called for by Senate Resolution 148, 85th Congress
Adopted 28 January 1958.

1. Navigation problems - Poquonock River is a small tidal inlet located on the north shore of Fishers Island Sound, about 3.5 miles west of Mystic River and about 2.3 miles east of the entrance to New London Harbor. Baker Cove lies just to the west of Poquonock River; the two waterways have a common mouth between Bushy Point on the southeast and Jupiter Point on the northwest. The waterway seaward of the mouth is known as Pine Island Bay.
2. The principal navigation problems in the area consist of a lack of protected anchorage of adequate depth for recreational craft in Pine Island Bay, which is exposed in part to southwesterly winds and shallow winding natural channels leading into Baker Cove and Poquonock River. Operators of boats using the channels must wait for favorable tides to reach berths and moorings in Baker Cove and Poquonock River.
3. Improvements Considered - Local interests have requested breakwater protection and anchorage improvements in Pine Island Bay and channel improvements in Baker Cove and Poquonock River. A plan of improvement consisting of a total anchorage area of 23 acres with a 100-foot wide, 6-foot deep access channel has been developed for the naturally protected area north of Pine Island. The estimated total cost of construction is \$329,000. The total annual benefits for the improvement would amount to \$64,700. The benefit-cost ratio would be 2.7 to 1.0. Dredging of a channel 100 feet wide, 6 feet deep, extending about 3,900 feet into Baker Cove with construction of marina at the head of the channel by local interests is estimated to cost \$367,500. Annual benefits resulting from this improvement would amount to \$38,200. The benefit-cost ratio is 1.5 to 1.0. Dredging of Poquonock River 6 feet deep, 100 feet wide for a total distance of 7,000 feet from Pine Island Bay to the naturally deep water in the upper third of the river would provide access for small recreational craft. The total cost of construction is

presently estimated to be \$555,000. However, because of the limited anchorage area available in the river, the cost of construction would exceed the benefits derived, resulting in a benefit-cost ratio of 0.4 to 1.0. In order to economically justify improvement of Poquonock River it would be necessary for local interests to construct a 200 boat marina in the upper portion of the river. At present no local interests are willing to provide such a facility.

4. Discussion: The study has revealed that navigation improvements at Pine Island Bay and Baker Cove are feasible and economically justified. However, officials of the city and town of Groton have indicated that the city and town are unable to meet the requirements of local cooperation for Federal navigation improvements at this time. Public access to the proposed Pine Island Bay improvement is not presently available and there is no assurance that suitable marinas would be provided at either Baker Cove or Poquonock River. In view of this, the Division Engineer recommends no Federal navigation improvement in the vicinity of Poquonock River at this time.